Comparison of Ferment Sugars, Produce Hemolysis and Measuring Growth in Methicillin-Resistant and Methicillin-Sensitive Staphylococcus aureus Isolates From Inpatients and Healthcare Workers in Gorgan Hospitals, North of Iran

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Background & Objectives: The mecA gene in *Staphylococcus aureus* leads to production of new penicillin-binding protein called PBP2a. This change may follow some changes in other phenotypes. The aim of this study was the comparison of Ferment Sugars, Produce Hemolysis and Measuring Growth in MRSA and MSSA isolates.

Methods: 188 Staphylococcus aureus isolates separated from inpatients and healthcare workers (healthy carriers) were studied. Bacterial cultures in blood agar environment at 37ºC during 24h and at 4ºC during other 24h were applied for studying hemolysis. Sugar fermentation carried out in phenol red Broth medium, containing glucose, galactose, arabinose, fructose, xylose, ramnose, mannose, sucrose, trehalose, raffinose or maltose. For determining bacterial growth, bacterial concentration of 103 was taken each hour during 12 cultured in MHA and colonies were counted after 24h.

Results: The mean amount of hemolysis diameter in MRSA isolates was rather more than that of MSSA isolates. The difference between MRSA and MSSA isolates were significant as to fermenting ramnose, trehalose, galactose and xylose ($p<0.05$). The mean rate of growth in MRSA were significantly different from that of MSSA isolates ($p=0.01$).

Conclusion: Resistance to methicillin in *Staphylococcus aureus* isolates accompanies the increase of ability to ferment sugars. This phenomenon may be one of reasons for increased pathogenicity of MRSA isolates; So results shows the logarithmic phase is longer in MRSA isolates, This may implicate that PBP2a production in methicillin-resistant isolates follows slowing down nutrients entrance into the bacterium that in turn may causes slow growth.

Keywords: *Staphylococcus aureus*; Generation Time; Hemolysis; Resistance To Methicillin; Sugar Fermentation